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Agricultural Experiment Station.

CHAMPAIGN, DECEMBER, 1893

BULLETIN NO. 28.

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A GRAPE DISEASE.

GRAPES, METHOD OF TRAINING.

GRAPES, TEST OF VARIETIES.

Experiment No. 40, Grapes; Test of Varieties.

This test of varieties of grapes was begun in the spring of 1888, with the first organization of the Experiment Station.

A comparatively high tract of land with light colored prairie soil is used for the grapes. It slopes gently to the south and is naturally fairly well drained. A line of tile running along the lower side at a depth of $3\frac{1}{2}$ feet makes the drainage still better.

The vines were set ten feet apart each way. This distance gives more room than may seem advisable for general planting; but it was thought that it would be more convenient for the inspection of varieties by those taking notes or by visitors. The distance apart in the row is greater than is needed by many of the varieties, while others would apparently use more to advantage.

Until the season just past all the varieties were trained to single stakes and a combination of the spur and renewal systems of pruning was used. The past year all were put on a two-wire trellis running north and south. Some varieties, especially the strong growing ones, yield decidedly more when on a trellis than when on stakes and it is much easier to keep them under control and to gather the fruit. Many of the bunches on vines trained to stakes become entangled and it is very difficult to pick them off without cutting them to pieces.

At the time of starting the vineyard all of the varieties standard for this latitude and all of what were considered the most promising of

the varieties not standard, fifty-four in all, were planted. With the exception of Concord, Moore's early, Worden, Ives seedling, and Delaware, only a single vine of a kind was set. While this is too small a number of plants from which to judge a whole variety, it did not seem advisable to plant more at that time and this preliminary report must therefore be taken with due allowance for further observation.

The results now obtained cannot be relied on *with certainty* even for the vineyard in which the varieties have been grown, and must be less trustworthy for other places. As an illustration of what is meant, the behavior of some of the varieties of which several vines were planted may be noted. Until the present season, all of the Concords have seemed in as good health as is usual with that variety. This season the leaves on one of the vines began to die about the latter part of July, and by the time the fruit should have been ripe nearly all the leaves were more or less affected, and at least one-third of them had fallen off. As a result of the diseased condition of the leaves, the fruit was very much later in ripening (at least a week or ten days), and it never attained either the size or richness in quality of the fruit on vines in perfect health. The vines also, necessarily, made less growth and ripened their wood less perfectly than those that had healthy foliage. The only difference between the treatment of the vine that was diseased and of those that remained healthy was in the method of training, and this was so slight, that it probably had no effect. Soil and culture were exactly the same, so far as one could judge by observation.

There are eight vines of Delaware growing in the same vineyard. In the season of 1892 one of them shed its leaves early from disease, and the fruit, as a consequence, failed to ripen. Although it was left until the fruit was all gone from the healthy vines, the fruit on this one was still green and sour. This year (1893) the vine that was diseased last year seemed to be in good health, while another one a short distance away shed its leaves prematurely and so failed to ripen its fruit properly. The method of training the two Delaware vines is somewhat different, though both are on a trellis. The behavior of Moore's early has not been the same for all the plants. Some of them shed their leaves so badly as to fail entirely to ripen the fruit; while on others that held their foliage as they should the fruit ripened well.

The same vine behaves differently in other respects than with reference to disease. During the seasons of 1890 and 1891 one vine of Worden bore larger and much more compact bunches of grapes and seemed to ripen them from 2 to 3 days earlier than the rest. All but this one were more like the Concord in fruit and season than they were like this one Worden. In fact, the similarity to Concord was so great it was decided that an error had been made and new plants were purchased to replace five of the old ones which were grubbed out. The new plants were set in the spring of 1892, and have not yet fruited. Both the crops of 1892 and 1893 on the special vine that had been sup-

posed to be a typical Worden, have been much more like the Concord than the crops of 1890 and 1891. Indeed, it would have passed readily at any time for a Concord, except for the difference in season, and a variation in season is frequently found in the same variety and is the result of different causes, such as disease, comparative amount of crop, cultivation, etc.

In consulting the descriptions of varieties and placing a value on each, it must be remembered that we have but a single plant of a kind, and that individuals of a variety vary as shown above. Many of the descriptions are made up from one year's fruit, and so could not be so accurate as if more time had been allowed. The descriptions are for the fruit and plants as grown here, and many of them would not hold for the same variety grown in other places.

The character of the season makes a great deal of difference in the quality of the grape, aside from what comes as a result of the health of the vine itself. A warm, sunny, and dry season will give grapes of excellent quality, if the vines are in good healthy condition; while a season of the opposite character will give fruit that is sour and poor in quality even on healthy vines. Fruit on a vine that is overloaded will not ripen so early and will not be so good in quality when it does ripen as that on a vine bearing less.

Fruit on vines that have shed their leaves from disease or other cause ripens later than on healthy vines and is always comparatively sour and poor in quality.

The descriptions and estimates of varieties as given here will be found in many instances not to agree with those published in other places, and especially not with those sent out in connection with varieties introduced as novelties. The reason may be easily found. There are few published descriptions of grapes as they are grown so far west as this. In making descriptions it seems to be the practice to use the very best bunches, such as are produced in the best grape growing localities and in the most favorable seasons. As grapes are usually grown, bunches so figured and described are seldom found. The estimates placed on many of the newer things will be found at variance with the introducers'. The one giving the description may be perfectly honest in what he says, but under different conditions the variety fails to develop the characters which he attributes to it. In giving the time of ripening of a variety comparison has usually been made with Concord, because that variety is more generally and better known than any other. The actual time of ripening varies with the season, and of course with the latitude in which the grapes are grown, while the comparative date remains practically the same. The season as it has been found here does not always agree with Downing's statements; for instance, he says Massasoit "ripens before Concord." Our report says, "season about one week later than Concord." Of course there is a possibility of error in the plant we have grown for Massasoit.

The yields have been estimated only, since it has seemed impracticable to secure and weigh the whole crop, except in a few cases. The estimate placed on quality is sometimes made up from fruit that was not entirely mature.

There are in all cases liabilities to error in the variety, both here and in the nursery, but great care has been exercised, both in buying from such houses only as are of known reliability and in keeping records here.

DESCRIPTIONS OF VARIETIES.

In the following descriptions the varieties have been arranged in alphabetical order; first, the black varieties, then the red, and next the white. After these is given a list of varieties that have so far been complete failures here.

There are growing in the vineyard 32 other varieties that have not been planted long enough to get results from them.

BLACK VARIETIES.

AMINIA.—Vine, a vigorous, open grower; shoot, 2 to 5 ft., short-jointed; leaf, healthy, thick, dark green; wood, well ripened. Bunch, medium size, tapering from base to apex; apt to be irregular, and not well filled. Berry, black, with a heavy blue bloom, large to very large, round, full of juice, rich, vinous, and of excellent quality; skin, thick, moderately tough; pulp, tender. Season is about the same as Concord. It keeps fairly well. The yield has been about 8 to 10 lb. each year for the past two years. The bunches are too irregular for a market grape, but the variety would be a good one for the amateur on account of quality.

AUGUST GIANT.—The plant this year has made a weak growth. It had previously been a very fair grower. The foliage has not been healthy. Shoot, 4 to 18 in., short-jointed. Bunch, very small, loose, not shouldered. Berry, small to almost large, often imperfect or immature, round, black with a blue bloom, of moderate quality, very foxy; pulp, tough. Season is 3 to 4 days later than Moore's early. The yield this season was about 1½ lb. The previous year it was about 6 lb. This, as grown here, has not seemed to be of any value.

BACCHUS.—Vine, a very rank, dense, grower; shoot, 4 to 10 ft., slender, short-jointed; the newer wood, heavily downy; leaf, small to medium in size, considerably spotted with disease. Bunch, small, compact, cylindrical, frequently shouldered, regular in shape. Berry, small, round, black with a thin bloom, full of juice, acid, rich, of high quality, appetizing; skin, tender; pulp, tough. Yield fairly good—about 7 lb. this season, and the same last. Said to be good for wine, and to many tastes is good for the table. Season is 4 days to a week after Concord. It would not be recommended for general cultivation.

BARRY.—Vine, a strong, vigorous, moderately dense grower; shoot, 2 to 5 ft., strong, short-jointed, stocky; leaf, dark green, thick, healthy; the lobes overlapping each other. Bunch, short, thick, sometimes shouldered, tapering abruptly and irregularly from the broad base to the tip, seldom perfectly filled. Berry, very large, round, almost black, with a heavy blue bloom, very juicy, sweet, and very rich to the taste; skin, thick, rather tough; pulp, tough. It can be kept until December without much difficulty. Has been a somewhat shy bearer. The crop for the past two years has been about 7 lb. each year. Would be recommended on account of keeping, and excellent quality. Like others of the Rodgers' hybrids, its reputation in other places is not uniformly good for health and vigor of vine.

CAMBRIDGE.—The vine, until the past season, was considered a vigorous grower, but this year the growth has been poor; shoot, 1 to 3 ft.; leaves have died and fallen off so that the fruit did not ripen well. Bunch, small to medium; not so large as last season, not well filled, seldom shouldered, tapering from base toward the apex. Berry, about medium size, variable, often imperfect, round, black with a thick bloom, full of juice; skin tender; pulp, rather tough, hard to separate from the seeds; similar in quality to Concord. The fruit ripened this year about 10 days after Concord; last year its season was about the same as Concord, but it ripens unevenly. Yield, about 8 lb. There seems no reason to recommend it for general planting, since the Concord, which it resembles, is better.

CHAMPION.—Vine, a very rank grower; shoot, 2 to 12 ft.; joint, of medium length; foliage, healthy; bunch, small to medium in size. It has seemed to be inferior in quality and has been a very shy bearer. The season is nearly the same as for Moore's early. It could not be recommended.

CONCORD.—Vine, a very vigorous grower, healthy, rather inclined to make too much wood where it is kept well cultivated or where pruned too close. Bunch, large, cylindrical, usually shouldered, moderately compact. Berry, large round, black with a heavy bloom, of uniform size when well ripened; sub-acid, rather rich, and with but little foxiness when well grown and ripened. Skin, very tender; pulp, tender, meaty. The berry drops too easily from the bunch and the grapes can be kept for a short time only after picking. This is still the standard grape and when a person cares to plant a single variety only, it would be recommended above all others. Even for one who wishes to plant several varieties, the Concord would take the leading place. The vines are comparatively free from disease, though the fruit is more liable to disease in this than in some other varieties. It seems our most regular and most prolific bearer.

CONQUEROR.—Vine, an excessively rank and dense grower; shoot, 4 to 10 ft.; short-jointed. Parts of the leaves show considerable disease, but this did not come in time to injure the fruit. Bunch, medium size, cylindrical, sometimes shouldered, not well filled, straggling. Berry, medium size, oval, black, with a very thin blue bloom; juicy, of only moderate quality. Skin, tough; pulp, slightly acid. Has not proved a good bearer. The yield this season was about 3 lb., last season a trifle more. It colors some time before it is fully ripe. Season, four days to a week later than Concord. Not recommended.

COTTAGE.—Plant a vigorous grower, rather open, with thick, leathery leaves; foliage usually very free from disease, though the same vine last season dropped nearly all of its leaves. Shoot, 2 to 5 ft; bunch, small, usually fairly compact, seldom shouldered, oblong. Berry, large, to very large, black, with a blue bloom, somewhat foxy, rank or harsh taste. Skin, thick and tough; pulp, tough. Not so good as Concord. It is a regular but not an abundant bearer. The crop for the past three years has been about 4 to 6 lb. Concords of the same age and with the same treatment yield at least twice as much fruit. The season is about one week earlier than Concord, and that, with its carrying quality, makes it desirable in many places for a distant market grape.

CYNTHIANA.—Vine, a very rank, dense grower, and very free from disease. Shoot, from 4 to 12 ft., smooth, short-jointed; leaf, large, pale green, the newer leaves yellowish. It continues to grow later in the fall than most other varieties, but the wood is sufficiently matured to prevent injury from cold. Bunch, small, oblong, usually compact and regular with a very long stem. Berry, very small, black, with a thin blue bloom, round, seedy, of high quality. It is of little value except as a wine grape and under our treatment it has been too shy a bearer to be of much value for that. The yield for the past season was not more than one-half a pound and the year before about 2 lb. It may become more productive with age.

EARLY MARKET.—Vine, a very vigorous grower; shoot, 3 to 6 ft.; strong, well ripened, makes too much wood; leaf, shows some downy mildew; bunch, small, cylindrical, slightly shouldered, compact. Berry, small, round, black with a very thin

bloom, juicy skin and pulp tender. The quality is only fair and the appearance is decidedly poor. Its season is two or three days earlier than Moore's early. The yield this season was about 5 lb. The vine is scarcely old enough to have reached full bearing. It has not so far seemed worthy of recommendation.

EARLY VICTOR.—Has usually made a very fair growth. This year it has been very weak and the foliage not healthy. Shoot, 1 to 2 ft.; bunch, small, seldom shouldered, short, oblong, compact. Berry, round, except where crowded, varies greatly in size from very small to medium, black with a blue bloom, very foxy, not juicy. Pulp, tough. About 4 to 5 days later than the Moore's early. The yield the past season was about 2½ lb. The two preceding years it has been about 5 to 7 lb. It does not have enough value as grown here to be recommended.

EATON.—A good grower, open; shoot, 2 to 5 ft., stocky, well ripened; leaf, large, dark green, mostly healthy. Bunch, small to almost large, tapering regularly, very poorly filled. Berry, very large, round, black with thin bloom, juicy, acid with a flavor that is scarcely agreeable; skin, moderately tender; pulp, tender. Season one week after Concord. It seems to be a shy bearer. The yield for the past two seasons has not been more than 1½ lb. Not worthy of recommendation.

EUMELAN.—Plant, a moderate grower, sturdy, healthy; shoot, 2 to 4 ft., short-jointed; leaf, healthy. Bunch, long, usually slender, fairly compact. Berry, medium size, black, round, with a heavy bloom, rich, of high quality; skin and flesh tender, rather dry; seed, large. The yield the past season was about 4½ lb. The previous season it was about 8. While only fairly productive, it should be recommended for general planting for home use on account of its good quality.

ESSEX.—Until the last year the vine has been a good, strong grower, somewhat open. The past season the growth was weak and not healthy. Shoot, from 1 to 3 ft., short-jointed; leaf, pale green, or yellowish. Many leaves dropped prematurely so that the fruit did not ripen perfectly. Bunch, very small, compact, not more than a dozen berries. Berry, very large, round, dark red or almost black, thin bloom and inconspicuous dots, full of juice, acid, not rich, of low quality, somewhat astringent; skin, thick, rather tough; pulp, tough. Not recommended for any one. Season 10 days later than Concord. Yield this year about one lb., and nearly the same or slightly more last year. Berry is of fine appearance, but there is nothing else to recommend the variety.

GAERTNER.—Vine, a strong grower, rather compact; shoot 3 to 5 ft., rather slender, long-jointed; wood, well ripened; leaf, large, very dark green, almost perfect in health. Bunch and berry very much like the Concord or Worden. Season with Concord. Yield about the same or possibly less. It would be hard for any one not an expert to distinguish between them. The resemblance is so close that it has seemed probable that a mistake was made. There is none of the character in this variety that is found in the other of Roger's hybrids, and which seems to distinguish them readily from most other grapes.

HARTFORD.—Vine, a vigorous grower; shoot, 1 to 3 ft. long, short-jointed, vine and foliage, almost perfect in health; shoots and leaves, very downy. Bunch, small to medium size, seldom shouldered, not compact. Berry, large, round, black with a heavy blue bloom, moderately juicy, sweetish, rich in quality, foxy, somewhat rank; skin and pulp, tough; seeds, hard to separate from the pulp. It has been a fair bearer. The yield the past season was about 7 lb. and the previous year about 10 lb. It ripens only a little later than Moore's early. It is not so desirable, however, as Moore's.

IRON CLAD.—The vine is an exceedingly rank and dense grower; shoot, from 5 to 20 ft., slender, long-jointed; leaf, small, dark green, smooth; both vine and leaf very free from disease. The vine would evidently do better with more room than has been allowed it, since, with its past treatment, it makes a great excess of wood. Bunch, small, oblong or cylindrical, compact, shouldered, irregular. Berry, small to medium

size, oblate, black with heavy, blue bloom, moderately juicy, slightly acid, but very rich, of high quality, but probably too sharp for most tastes; skin, tender and thin; pulp, separates from the seeds with difficulty. It resembles the Clinton in many respects and would be a good wine grape. Season about same as, or a little later than, Concord. The yield this season was about 3 lb.; last year it was nearly 8.

ISABELLA.—Vine, a rank grower, rather dense, shoot, 4 to 7 ft., downy, short-jointed; leaf, dark green, large, healthy; a fine looking vine with well ripened wood. Bunch, medium to large, long, tapering, rather loose, seldom shouldered. Berry, large, oval, black with heavy blue bloom, juicy, slightly acid, rich, of high quality; hangs well on the bunch; skin, thick and tough; pulp, tender, meaty. The season is about one week later than Concord; but it can be kept for several weeks after being picked, if put in a proper place. It has not been planted long enough to reach full bearing. The yield the past season was about 6 lb. This variety is one of those that color some time before they are ripe, and should be left on the vine for a week or two after being fully colored. It is one of the old varieties but has not been successful over a large part of the country, yet seems very promising here.

IVES SEEDLING.—The vine is a rather rank grower and is generally very free from disease. Shoot, long-jointed and downy; leaf, downy, light green, and deeply lobed. Bunch, above the medium size, compact, but little shouldered, or the shoulder consisting of a few (1 to 4) berries on a rather long stem. Berry, large, with a blue bloom, oval, of medium size, juicy, sweet and free from the foxy flavor; skin and pulp tough, foxy and rank. It begins to ripen about a week before Concord and will hang on the vines until the berries dry up, improving in quality until they begin to shrivel. It stands transportation well and is very productive. Would not recommend it for home use.

JEWEL.—The vine made a fair growth in previous years, but the past year (1893) has seemed nearly dead; shoot, 6 to 18 in.; leaf, yellowish and sickly in appearance. Berry, medium size, round, black with a blue bloom, juicy, sweet, rich with little or no foxiness; skin and pulp tough. This is one of the best varieties in quality, but it has not borne enough so far to make it seem worthy of recommendation.

HUBER'S No. 12.—Vine, a very strong grower, not dense; shoot, well ripened, downy, slender, joint of medium length, drooping; leaf, large, but little lobed, dark green; a very healthy promising vine. Bunch, medium size, compact, not apt to be shouldered, oblong. Berry, round, black with a heavy blue bloom, varies from small to very large, full of juice, moderately sweet, very rich, drops from the bunch in a short time after picking; skin, rather tender; pulp, tender. Seems to be a moderate bearer. The yield this year was about 3½ lb. Last year it was some more than 4 lb. The season is about one week later than Concord. This is a new variety not yet introduced and has not been planted long enough to come fully into bearing.

MARION.—Vine, a very rank, dense grower; shoot, 4 to 12 ft., rather slender, dark brown, ripe almost to the tips; leaf, large, dark green, healthy, except for the *phylloxera*. Bunch, medium to almost large, shouldered, tapering slightly from base to apex, compact, regular. Berry, medium to almost large in size, oblate, black with blue bloom, moderately juicy, acid, very high in quality, a little too sharp for most tastes; skin, thin and tender; pulp, tough, hard to separate from seeds. Season only three or four days after Concord. It yields well. The crop for the past two seasons has been about 10 lb. each year. The birds seem to take this more than any other variety in the vineyard.

MILLS.—The plant at first made a very strong, healthy growth and seemed promising, but the past two seasons it has grown almost none and appears to be half dead. The bunch is large, heavily shouldered, cylindrical; with many imperfectly developed berries, giving it a very straggling appearance. Berry, medium size, very high in quality; skin, very thick and leathery; pulp, large and tough. Its season is a little later

than Concord. The fruit keeps well, but with us it has developed no other quality to recommend it.

MONTEFIORE.—Vine, a vigorous grower, not dense; shoot, 3 to 8 ft.; leaf, large, dark green, deeply lobed and toothed, free from disease. Bunch, medium size, rather long, cylindrical, fairly regular, compact, shouldered. Berry, medium to large, ovate, black with a heavy blue bloom, moderately juicy, moderately sweet, rich, one of the best in quality; skin and pulp tough. The yield the past three seasons has been about 6 to 9 lb. It ripens soon after Moore's early and will keep and hang on the vines until the berries dry up, and continues to improve in quality until after the berries are considerably shriveled. The fruit has seemed less liable to disease than that of many other varieties. It would be recommended for those who like high quality.

MOORE'S EARLY.—Vine, a moderate and rather open grower; shoot, 2 to 4 ft.; joint, medium length. Bunch, medium size, shouldered in the best specimens, not very compact. Berry, large, round, black with a blue bloom, moderately juicy, of very good quality when well ripened; skin, thin, tender; pulp, tender. Ordinarily the plants are healthy; but this season nearly all of them were injured by some disease, the nature of which is not known. The leaves began dying at the edges by the middle of the summer and by the time the fruit should have ripened some of the plants were completely stripped of their leaves. The same disease seems also to attack the young shoots; for when the vines were pruned it was found that the shoots were dead back nearly, or in many cases quite, to the old wood. It is a question how serious the injury to the vines will prove, or how long it may last. The Moore's early is generally conceded to be the best early black grape.

NEW HAVEN.—The Vine, until the past season, has been a very fair grower and healthy. The past season the growth has been weak and unhealthy in appearance; shoot, 8 in. to 2 ft. The leaves have died and fallen badly. Bunch, very small, seldom shouldered, loose. Berry, small to medium, black with blue bloom, round, rather dry, slightly astringent in after taste; skin, tender; pulp, tough. This year it was not so good in quality as it had been in former years, though it has never stood high. Season is only a little later than Moore's early. The yield the past season was about 2½ lb. The variety does not seem worthy of recommendation here.

NORTON'S VIRGINIA.—Vine, an exceedingly rank grower; shoot, 5 to 15 ft., short-jointed; the newer part with a thin bloom; leaf, thick, pale green, badly infested with the powdery mildew. Bunch, medium size, compact, cylindrical with a shoulder sometimes broader at the base. Berry, small, or very small, black with a heavy blue bloom that gives the fruit a bluish appearance, moderately juicy, acid, moderately rich; skin and pulp, tender. This variety has a high reputation as a wine grape and it is of little value for any other purpose. Its season is from 3 days to a week later than Concord. It has proved a very shy bearer so far under our treatment, though it may improve with age. It would also be likely to do better if allowed more room. The yield the past season was about 3 lb. on a vine that was as large as Concord that produce 20 lb.

NORWOOD.—The vine is a fairly vigorous grower without making an excess of wood; shoot, 1 to 3 ft. The leaf and vine have been very free from disease. Bunch, when well filled very large and fairly compact, but a very small proportion only reach perfection. Most of them are very small and loose. The perfect bunches are heavily shouldered and taper from the shoulder almost to a point. Berry, very large, round, almost black with a heavy blue bloom, rather acid, not rich with a musky taste and smell; skin, tough and thick; pulp, large and tough. The fruit ought to ship well, and, where good bunches can be had, sell well. It is not equal to the others of Roger's hybrids or to the Concord in quality. Its season is from one to two weeks later than Concord. It has borne a fair quantity of fruit, yield the past season being about 6 lb. The variety is scarcely to be recommended for the general planter.

ORIENTAL.—Vine has made a very moderate, though healthy growth; shoot, 1 to

3 ft., stocky, short-jointed. The growth the past season was only about half as much as it had been the year before. Leaf, dark green, mainly healthy, but showing some traces of the downy mildew. Bunch, medium size, oblong, seldom shouldered, somewhat irregular. Berry, large, oval, dark red, almost black with a thin bloom, juicy, sweet, very rich, and of high quality; skin, rather tender; pulp, tough. Though it has not been tried for keeping, it has the appearance of a grape that would keep well. Its season is about 3 to 4 days later than Moore's early, and it yields better than that well known variety. The past two seasons the yield has been about 7 to 8 lb. It would not be a good market grape on account of the irregular appearance of the bunches. It is similar in many respects to Montefiore.

POSTOAK GRAPE.—(*Vitis linccumii*.) Vine, a rank, open grower, short-jointed, strong, and stocky with a bloom on the bark of the new wood; leaf, large, thick and coarse, bright green. This comes as near being a perfect type of health as any variety in the vineyard. Shoot, 4 to 10 ft. Bunch, above the medium size, strongly shouldered, cylindrical, compact. Berry, medium size, oblate, black with a heavy blue bloom and conspicuous dots, meaty, with an agreeable appetizing flavor, quality, high; skin, tender; pulp, moderately tender. Seems to be only a very moderate bearer, but will probably do better as the vine grows older. It is similar in some respects to Norton's Virginia or Cynthiana, but seems decidedly superior to either in quality, yield and size, and would probably make as good a wine grape. It would seem to have very decided value for purposes of improvement; either by crossing with other varieties or by growing seedlings. In season it is about one week later than Concord. This is not a recognized variety, but was sent here simply as a representative of the species. The name *Postoak* is the common name of the species.

VICTORIA.—Vine, a very fair grower, open; shoot, 2 to 4 ft., stocky; leaf, dark green, but little affected by disease. Bunch, very small, short and thick, not more than 10 to 12 berries in the best ones. Berry, large, round, dark purple, scarcely black with a thin bloom, full of juice, mild acid without decided character, poor in quality; skin, tender; pulp, tender, but stringy. The yield was about $\frac{1}{4}$ lb. this year, and nearly $\frac{1}{2}$ last. Season about one week later than Concord. So far there seems no reason for recommending it here.

J. A. WARDER.—Vine, a strong, moderately dense grower; shoot, 3 to 6 ft., rather slender with but few tendrils; leaf, large, dark green, healthy; very similar to Concord. This is a new variety, originated by Mr. Huber, of Illinois City, Ill., and is not yet introduced. It seems very similar in every way to the Concord, fruit as well as vine. It is two or three days earlier, the berries a trifle more juicy and scarcely so good in quality as the Concord. The berries drop badly from the bunch when picked.

WHITE HALL.—The plant, until the past year, has been a fair grower and comparatively healthy. The past season it was very weak; shoot, only 6 to 18 in.; leaf, yellowish, not healthy. Bunch, small, loose, commonly shouldered. Berry, below medium size, round, or inclined to oval, black with a thin bloom, not juicy; pulp, moderately tender. No note was made as to quality before the present year. Fruit sour, poor in quality, not pleasant to the taste. Its season is nearly the same as Moore's early. It has been a shy bearer. From present indications it is not worthy of recommendation.

WILDER.—Vine, a fair grower; shoot, 2 to 3 ft., slender, joint, medium; leaf, medium size, deeply lobed, dark green, considerably diseased. Bunch, medium to large, sometimes shouldered, tapering from base to point. Berry, medium to large, black, round. It has been a shy bearer so far, though the vine is not yet old enough to show its character in this respect. The yield this season was but about 1 lb.

RED VARIETIES.

AGAWAM.—The vine has been a moderate grower, rather open, and comparatively free from disease until the past year when it has made a weak growth and the whole

vine has looked unthrifty. Bunch, small to medium size, usually shouldered where well grown, fairly well filled. Berry, medium size, purplish red with bluish bloom, round, very juicy, slightly acid, rich and very pleasant in flavor; skin, thin and tender; pulp, tender. Until the past year this has seemed an exceedingly promising variety, an abundant bearer and of excellent quality. It would still be recommended for trial to those who care for more variety. The yield the past season was about 4 lb., and the previous year about 8 lb. It is only a little later than Concord.

ALBERT.—Vine, a rank grower, not dense; shoot 5 to 7 ft., stocky, well ripened; joint, medium length; leaf, large, rounded in outline, almost free from disease. Bunch, small, rounded, compact, only 12 to 20 berries in the best ones. Berry, very large, round, red with a bluish bloom, moderately juicy; sweet, spicy, vinous, very rich, taking almost the richness of preserves as it becomes over ripe; skin, thin and tender; pulp, a little tough, but separates easily from the seeds. It ought to be a good keeper, but has not been tried. Its season is about the same as Concord. It has not been planted long enough to come into full bearing. The yield this season was about 3 lb. This is one of Mr. Huber's seedlings that has not yet been disseminated. It would seem to be desirable, at least for the amateur.

AMBER QUEEN.—Vine, a strong, sturdy, rather open grower; shoot 2 to 5 ft., stiff, short-jointed, leaf, thick, leathery, and comparatively healthy. Bunch, medium size to almost large, loose or open, tapering from base to tip, not very regular. Berry, large, to very large, round, light red with a thin bloom and conspicuous dots, full of juice, rather tart, rich, of high quality; skin, rather tough, pulp, tender, separates easily from the seeds. A fairly prolific bearer. Yield for the past three seasons has been about 8 to 10 lb. each year. Its season is a week to 10 days later than Concord. It is a promising variety so far as tried.

BEAGLE.—Vine, a very rank, dense grower; shoot, 3 to 10 ft.; wood, well ripened; leaf, small to medium, healthy. Bunch, small to medium, slightly shouldered. Berry, small to medium, red with a light bloom, round, very good in quality; skin and pulp, tender. This has so far seemed to be shy bearer. The crop this season was about 1 lb. It will probably do better as the vine grows older. Season about one week before Concord.

BEAUTY.—Until the past year the vine has been a very good grower, comparatively free from disease, and was counted as one of the most promising of the red grapes. This season the vine has been nearly dead, the shoots making only 6 to 12 in. of growth. The leaves began to die early and before time for the fruit to ripen the plant was nearly naked. Bunch, medium size, shouldered, compact. Berry, medium size to almost large, light red with thin bloom, very juicy, mild, very pleasant, not rich, without decided character; skin, very tender; pulp, tender, separates very easily from the seed. This grape keeps very well. The fruit remained in good condition last year until the holidays. Season a little later than Concord.

BRIGHTON.—Vine, a rank grower, not dense; shoot, 3 to 8 ft.; joint, medium; leaf, good size, very dark, apt to become more or less diseased in the latter part of the season and drop off, though this has not so far seemed to affect the fruit. Bunch, very large varying from compact to loose, broad at the base, tapering irregularly to the tip, can more properly be called branched than shouldered. Berry, above the medium size, round, purplish red when fully colored with a blue bloom, mild, sweet, and exceedingly pleasant flavored without decided character; skin, tender; pulp, very tender, slightly stringy, very juicy, and easily separated from the seed. Its season is about ten days later than Concord. It is at its best soon after it begins to color and loses its sprightly taste when it becomes over ripe. Both the bunches and berries ripen somewhat unevenly. It has so far been an abundant and regular bearer the crop being about 10 to 12 lb. each year for the past three years. It is to be recommended for the amateur or the nearby markets for table use. Complaint has been made in other places that it is liable to disease and lacks hardiness.

BRILLIANT.—Vine, a good grower, not dense; shoot, 2 to 6 ft., stocky, short-jointed, healthy, well ripened; leaf, rather small, comparatively free from disease. Bunch, small to medium, irregular in shape, usually shouldered, not compact. Berry, medium to large, red with a thick blue bloom that makes it almost purple, sweet, rich, vinous. one of the best in quality; skin, tender; pulp, very tender, juicy, separates easily from the seeds. The crop this year was about 5 lb. This is a new variety recently introduced by Mr. Munson, of Denison, Texas. It is so far the most prolific of those of his grapes that we have tried, and is one of the best of grapes in quality. Its season is a little earlier than the Concord. It is to be recommended, at least for the amateur.

CHALLENGE.—Vine, an exceedingly rank and dense grower; shoot, slender, 5 to 15 ft., well ripened; leaf, medium size, dark green, almost perfect in health. Bunch, small, oblong or almost cylindrical, compact, regular, frequently heavily shouldered. Berry, medium size, round, light reddish purple with a very thin bloom and inconspicuous dots, full of juice; slightly acid with little richness; quality good, not high; skin, thin, tender; pulp, tough and hard to separate from the seeds. Season a few days later than the Concord. The yield this year was about 6 lb. Last year there were only a few bunches. Too rank a grower for the space allowed it, and would likely be more productive if given more room. Not recommended.

DELAWARE.—Vine, a good grower, somewhat dense; shoot, 2 to 6 ft., very short-jointed; wood, hard and close grained, well ripened; leaf, small usually healthy, though occasionally dropping from the vine soon after the middle of the season in which case the fruit does not ripen properly, but remains sour and colors but little or not at all. Bunch, very small and compact, shouldered, cylindrical. Berry, round, small, pale red with a delicate color, almost transparent and thin white bloom, full of juice, sweet, rich with a vinous spicy, delicate, flavor that is exceedingly agreeable to most tastes; skin, thin, rather tough; pulp, tender. Plants on stakes have yielded about 4 lb., and those on trellis from 8 to 12 lb. each for the past three years. The Delaware has not proved to be reliable with all growers or in all localities. Two vines which have been growing for about 20 years in another vineyard, less than one-fourth mile away, have been very poor growers and have not been known to so much as produce one pound of grapes in a season. Notwithstanding its want of reliability, it should have a place in every vineyard or arbor where grapes are grown for home use. Its season is nearly the same as Concord, but it will keep much longer.

DIANA.—Vine, a rather rank grower, moderately dense; shoot, 3 to 8 feet., downy; wood, well ripened; leaf, large, dark green, in excellent health. Bunch, medium to large, compact, either cylindrical or tapering. Berry, varying from small to almost large, round, pale red with a thin bloom and brown dots, juicy, sweet, very rich, one of the best in quality; skin, thin and tender; pulp, tender. Season about 8 to 10 days after Concord. The yield this season was about 4 lb. The vine is not old enough to have reached full bearing. It is to be recommended for quality, at least, and its appearance would indicate a fair keeper.

DINKEL.—Vine last year seemed to be a moderately good grower, but this year it is weak; shoot, 6 to 18 in., short-jointed stiff and stocky; foliage, healthy. Bunch, medium to large, broad at the base, narrowing gradually to the point, rather straggling. Berry, medium size, round, light red with a light bloom, juicy, slightly acid, but rich and very pleasant; skin, rather thick and tough, with a slight astringent taste; pulp, tender. It seems to be a shy bearer, but may improve with age. Season 7 to 10 days after Concord.

DRACUT AMBER.—Vine, is a rank, rather dense grower; shoot, 4 to 10 ft. The leaves have been badly diseased the past season and before the fruit was ripe half of them had fallen off. No indications of the disease had been shown in other years. Bunch, small, oblong or cylindrical, very compact when perfect, seldom shouldered. Berry, medium size, round, red in fine specks on greenish white with a thin bloom, full of juice, musky or foxy, slightly acid, moderate in quality; skin, tender, thin;

pulp, very tender. Yield was about 4 lb. for last year and $1\frac{1}{2}$ for this. It ripened this year about two weeks after Concord. In proper health it should ripen nearly with the Concord. It does not seem desirable except as a variety.

GOETHE.—Vine, a moderate, open grower; shoot, 2 to 4 ft.; wood, not well ripened; leaf, medium size, light green, considerably infested with mildew, to which it seems specially subject. Bunch, small to medium, irregular, not well filled, tapering from the base to the tip with many imperfect berries. Berry, medium to very large, oval, pale red with a thin bloom, full of juice, a mild, pleasant almost acid taste, not rich; skin, thin and tender; pulp, very tender and easily separated from the seeds. It keeps very well until the holidays. Its season is about 10 days to 2 weeks after Concord. It has so far been a shy bearer. The yields for the past three years have been about 2 to 4 lb.

HERBERT.—Vine, a very strong, rather open grower; shoot, 2 to 6 ft., strong, light brown, short-jointed; wood, well ripened; leaf, showing some traces of mildew, but otherwise healthy. Bunch, medium size, short and broad, tapering from base to the tip, scarcely regular, open, not shouldered. Berry, large to very large, round, black with a thin bloom, moderately juicy, sweetish, rich, of high quality, but with a slightly acid after taste; skin, thick, rather tough; pulp, rather tough. The yield the past season was about 5 lb. The vine is scarcely old enough to be in full bearing. Season about 4 days to a week after Concord.

IONA.—The vine has grown well until the past year when it was very weak; shoot, 9 to 18 in.; leaf, yellow, and sickly, but apparently free from fungus diseases. Bunch, medium size, not well filled, tapering from the base to the tip. Berry, of medium size, oval, light red with bluish bloom, moderately juicy, sweet with a rich pleasant flavor, one of the best in quality; skin, thin and tender; pulp, tender. Its season is about 7 to 10 days later than Concord. The yield this season was about $2\frac{1}{2}$ lb. It seems so far to be too shy a bearer to be recommended.

JEFFERSON.—Another of the varieties that have not done so well the past year, either in growth or fruit, as they had previously. Bunch, small, imperfect. Berry, medium size, round, bright red with a thin bloom, juicy, rich, neither sweet nor acid, very agreeable, best in quality; skin, tender; pulp, tender, meaty. The yield the past season was about 1 lb. and the year before 6 lb. This variety had been considered one of the most promising of the red grapes, but the results of the last season would not justify recommending it.

LINDLEY.—The vine is a strong grower, without making an excess of wood, healthy; wood, well ripened; leaf, comparatively free from disease. Bunch, large, shouldered when perfect, usually not well filled, tapering from the base to the apex. Berry, very large, round, red with thin bluish bloom, full of juice, slightly musky, sweet, rich, one of the best in quality; skin, tender, pulp, rather tough, but small. Its use would be table or market. It would sell well either from its appearance or on its merits, and would bear shipment better than Concord which is about the same in season. It has proved so far to be a prolific bearer. To be recommended highly for home use or market.

LYON.—Vine, a very rank and dense grower; shoot, numerous, 2 to 8 ft., long-jointed, smooth. Bunch, very small, oblong and compact, seldom, if ever shouldered. Berry, small, round, dark red, dry, pleasant flavor, rather sweet and rich; skin and pulp, very tender. Season one week earlier than Concord. It seems to be a shy bearer. The yield for this season was about $\frac{1}{2}$ lb. and for the previous year about 2 lb.

MASSASOIT.—Vine, a moderate, open grower; shoot, 2 to 4 ft.; wood, not well ripened. Bunch, above medium size, short and thick, irregular, tapering from a broad base to the tip, only moderately well filled. Berry, large to very large, round, reddish amber with a thin bloom, full of juice, slightly acid, mild and very pleasant, but not high in quality; skin, thin and very tender; pulp, very tender, would please the

taste of a great many. The season is about one week later than Concord. It is a very fair bearer. The yield for the past three years has been from about 6 to 10 lb. It would be recommended to the amateur or for a fancy market.

MOYER.—Plant, a very slow grower with shoots of only 1 to 3 ft. per year, short-jointed, bushy, compact. Unless it grows stronger in other places it could be planted 4 feet each way. The foliage has not been healthy. Bunch, very small, compact, usually well filled, the larger ones shouldered, oblong, regular. Berry, medium size, red with a blue bloom, moderately juicy, sweet, rich of very good quality. The yield for the past two years has been about 2½ lb. It might be recommended for the amateur who desires a long list of varieties. Its season is about one week earlier than Concord.

NORFOLK.—Vine, a strong grower, somewhat open; shoot, 4 to 10 ft., stocky; wood, not well ripened; leaf, large, rough, subject to downy mildew. Bunch, medium to large, broad at base, tapering irregularly to the tip, usually well filled. Berry, oval, large, reddish purple with a blue bloom; juicy, slightly acid, but very pleasant and agreeable; skin rather tough, thick; pulp, tough and hard to separate from the seeds. Its season is about 10 days after Concord. It has so far been a shy bearer. The yield for the past two seasons has been only about 4 lb. each year. It could scarcely be recommended except for the sake of variety.

ONEIDA.—Vine has made a very weak growth this year and is not at all healthy. shoot, 4 to 12 in., leaf, yellowish green, not healthy. Its diseased condition would affect the quality of the fruit and the ripening of the wood very decidedly. Previous to this season it seemed to be a fair grower and comparatively free from disease. Bunch, small to medium, cylindrical, not shouldered, well filled, fairly regular. Berry varies from very small to medium in size, round, white to bright pink with a very thin bloom, sweet without richness or other decided character, flat; skin, very thick and tough; pulp, tender, meaty. Its season is two weeks later than Concord. It would probably keep well. It is a shy bearer and could not be recommended.

PERKINS.—Vine has made a moderately healthy, stocky growth; shoot, 2 to 6 ft., joints usually short; wood, well ripened; foliage, comparatively healthy. Bunch, small, seldom shouldered, cylindrical, commonly well filled and regular. Berry, large, oval, light green and red with a thin bloom, moderately juicy, sweetish, flavor good, foxy; skin, very tender; pulp, very tender, meaty. This variety produces fairly well. The yield the past three years has been from 6 to 10 lb. It ships well and is grown to some extent as a market grape. It has not seemed so desirable here as many other varieties.

ROCHESTER.—The vine made growths two years ago of 2 to 6 ft. and appeared vigorous and healthy. The past year the shoots were only 6 to 18 in. with small, yellow sickly leaves. Bunch, medium to almost large, broad at the base, tapering to the tip, compact, often imperfect. Berry, medium size, variable, round, purplish red with a thin bloom and small dots, full of juice, acid without high quality; skin, thin, astringent; pulp, stringy. The season was two weeks or more later than Concord. It would undoubtedly have been earlier and of much better quality if the vine had been in good health.

RUBY.—Vine, a very vigorous and dense grower; shoot, 2 to 8 ft., healthy, well ripened; leaf, perfectly healthy. Bunch, small, shouldered, very imperfectly filled, only a few good berries on each, the rest only partly developing. Berry, medium to large, round, red with greenish stripes, mild, pleasant, not of high quality; skin, very tender; pulp, very tender, meaty. It has been a very shy bearer but will improve with age. There was not more than one-half a pound on a vine that was large enough to have borne 10 or 15 lb. Its season is nearly the same as Concord.

SALEM.—Vine, a fair grower, though not so strong this year as previously, open shoot, 1 to 5 ft., fairly well ripened; foliage, fairly healthy. Bunch, medium size,

short and broad, tapering from base, not regular, not well filled, loose, seldom shouldered. Berry large to very large, red with a thin bloom and inconspicuous brown dots, round, full of juice, of very pleasant taste, and sweetish, good in quality, without decided character; skin, rather thin and tough; pulp, easily separated from the seeds, slightly stringy. Season, about 4 to 7 days later than Concord. It has been only a moderate bearer. There are others of Roger's hybrids very similar in character that have been very much more productive.

ULSTER PROLIFIC.—Vine has been a very weak grower; shoot, 1 to 2 ft., slender, short-jointed; wood, well ripened; leaf, small, yellow without apparent disease. Bunch, small. Berry, small, round, bright red, of very good quality. The yield for the past two years has been about $\frac{1}{2}$ to 1 lb.

VERGENNES.—Vine, a moderate grower; shoot, $1\frac{1}{2}$ to 3 ft., short-jointed; leaves have nearly all died and fallen off. It has not done so well the past season as it had before. Bunch, small to medium size, oval, scarcely shouldered, compact, regular. Berry, nearly round, light red with a thin bloom and conspicuous dots; varies from medium or small to large in size, juicy, sweet and rich; skin, thick, rather tough; pulp, very tender, separates easily from the seeds. The yield is about 8 lb. Its season is some earlier than Concord. Until the past season this had been considered a very promising red grape. It may not show the same failing next year, but until after a longer trial it could not be recommended with any degree of confidence.

WOODRUFF RED.—Vine, a moderately good grower; shoot, 2 to $3\frac{1}{2}$ ft., short-jointed; foliage only fairly free from disease. Bunch, medium size, frequently shouldered, very compact, oval, or oblong, regular. Berry, large, light red, bloom, thin, juicy, sweet, rich; skin, very tender; pulp, tender, easily separated from the seed; very good in quality. Its season is about 3 to 4 days after Concord. The yield for the past two seasons has been about 8 lb. a year. It would be recommended to the amateur for home use or for a near market.

PETER WYLIE.—The vine has proved to be a weak grower always unhealthy in appearance. Bunch and berry, very small and not of a desirable quality. From experience here it could not be recommended for any purpose,

WYOMING RED.—Vine, a rank, moderately dense grower; shoot, 3 to 8 ft.; wood, healthy and well ripened; leaf, pale green, glossy, comparatively healthy; Bunch, small, oblong or tapering slightly from the base, moderately compact. Berry, a clear light red with a bluish bloom, medium size, oval, juicy, sweetish, very musky, quality good; skin and pulp, rather tough. The rats sometimes take it very badly, while they seldom trouble the other varieties. It is a rather shy bearer. Its season is about 3 to 4 days later than Concord. It is not to be recommended except to add to the number of varieties.

WHITE VARIETIES.

ALPHONSE.—Vine, a strong grower, open; shoot, 2 to 5 ft., downy, slender, short-jointed; wood, not well ripened; leaf, somewhat subject to disease. Bunch, medium size, not well filled, usually with a small shoulder. Berry, large, oval, creamy white with thin bloom, but little juice, mild, pleasant, without decided quality; skin, tender; pulp, very tender, breaking. This has been a very shy bearer yielding less than 1 lb. either last year or this. Its season is a little later than Concord. This is a new variety not yet disseminated, and from experience here so far could not be recommended. It may improve as the vine grows older.

BARBARA.—Vine, a fair open grower; shoot, 2 to 3 ft., slender; wood, well ripened; leaf, of medium size, comparatively free from disease. Bunch, small, irregular. Berry, medium size, creamy white, almost yellowish white, rather dry, sweet, rich, of excellent flavor; skin, thin and tender; pulp, very tender, meaty, breaking. Seems to be a shy bearer. Yield this year was about 1 lb. This is a new variety not yet introduced and has not been grown long enough to reach full bearing.

BELL.—Vine, a rank, rather dense grower; shoot, 3 to 8 ft., long-jointed, strong; leaf, generally free from disease. Bunch, small to medium size, not well filled, usually shouldered. Berry, medium size, white with a slight bloom, juicy, and agreeable; skin, tender; pulp, very tender; of excellent quality for eating or table use. It has been a shy bearer so far, but the vine has not been set long enough to reach full bearing. The yield the past season was less than 1 lb.

CAMPBELL.—Vine last year seemed to be a fairly good grower and productive. This year it has made a very weak growth and does not appear healthy. Bunch, small, imperfect. Berry, medium size, white with light bloom of excellent quality; skin, very tender; pulp, exceedingly tender and meaty. Its season is about one week earlier than Concord.

CENTENNIAL.—The vine has grown well and seemed healthy until the last season when it made a poor growth; shoot, short and stocky. Bunch, medium to large, usually shouldered in good specimens, tapering from the base to the tip, compact. Berry, small to almost medium size, round, greenish white with a purplish, bluish, and thin bloom, full of juice, slightly acid, very pleasant, moderately rich, agreeable flavor; skin, tender, thin; pulp, moderately tender. The yield for the past two seasons has been about 6 lb. each year. It ripens about two weeks after Concord. The bunches are very imperfect and present an uninviting appearance.

DUCHESS.—The plant made a very good growth for the first three years, but the past season it has been sickly and the growth very weak. Bunch, medium size, loose, tapering from the base to the tip. Berry, medium size, white, acid; quality only fair. The crop for the past year was about 1 lb. and for the year before about 10 lb.

ELDORADO.—Vine, a moderate grower, healthy. Bunch, of medium size or below, usually not well filled, shoulder large. Berry, round, greenish white with a white bloom, variable in size and often imperfect; mild, pleasant, sweet, not rich or foxy; quality very good; skin and pulp, tender. Season is nearly the same as Moore's early. Use, table or near market. It would not bear much handling. It is only a moderate bearer.

ELVIRA.—Vine, a very strong, dense grower; shoot, 3 to 6 ft., short-jointed; wood, well ripened; leaf, almost perfectly healthy. Bunch, small, very firm, ovate or oblong, seldom shouldered. Berry, crowded, compressed, greenish white, medium size, varying to small, moderately juicy, acid, of poor quality; skin, very tender; pulp, meaty, very tender. The crop for the past three years has been from 8 to 15 lb. Its season is a little later than Concord. It might be recommended for making jellies, etc.

EMPIRE STATE.—Vine, a good grower, moderately dense; shoot, 2 to 4 ft., branching, short-jointed; leaf, subject to downy mildew. Bunch, small, oblong, regular, seldom shouldered, compact. Berry, medium size or above, round, pale, greenish white with a very thin bloom and a few inconspicuous brown dots, almost transparent, juicy, sugary sweet, not of high quality; skin, thick, moderately tender; pulp, tender. The yield this season was about 10 lb. It ripens about one week later than Concord. It might be of value to one who likes a very sweet grape but does not care so much for other qualities.

ETTA.—Vine, a rank, dense grower, healthy; shoot, 3 to 8 ft., rather stocky, short-jointed; leaf, thick, large and healthy. Bunch, small, oval or oblong in outline, very compact, not shouldered. Berry, small to medium size, oval from being compressed, greenish white with a thin whitish bloom, full of juice, acid not rich, but pleasant and agreeable when fully ripe; skin, tender; pulp, tender. This variety is a very prolific bearer. The yield for the past three years has been from 10 to 15 lb. Its season is from a week to 10 days later than Concord. It would only be recommended for jellies, etc. It is very similar in many respects to Elvira.

FAITH.—Vine, a moderate grower; shoot, 1 to 4 ft., short-jointed, not well ripened

leaf, badly diseased so early as to hurt both wood and fruit. Bunch, very small. Berry, very small, white; skin, tender; pulp, sweet and rich. It is a poor bearer and is not recommended.

GOLD COIN.—Vine, a strong grower; shoot, 2 to 6 ft., rather slender, comparatively healthy; leaf, somewhat liable to downy mildew. Bunch, of medium size, open, tapering from a broad base to the tip. Berry, large, round, creamy white with a thin bloom and a few brown dots, showy, juicy, sweet, moderately rich, very good; skin, thick, tough; pulp, tender. Its season is about one week after Concord. It is a fair bearer. The yield this season was about 6 lb. The fruit adheres well to the bunch and ought to keep well. The vine is not yet old enough to have reached full bearing.

GOLDEN GEM.—A very weak grower, compact; shoot, 6 to 18 in., slender short-jointed; leaf, very small, comparatively free from disease. Bunch, very small, ragged, loose, irregular in form. Berry, small, nearly round, white or creamy white with a thin bloom, moderately juicy, slightly acid, very pleasant in taste, vinous; skin, very tender; pulp, tender, easily separated from the seeds. Season is about the same as, or later than, Concord. A very shy bearer. There seems to be no reason to recommend it.

GREEN MOUNTAIN.—Vine, a moderate grower, compact; shoot 2 to 4 ft., slender, well ripened and healthy; leaf, below medium size, light green; free from disease. Bunch, medium size, tapering from the base without distinct shoulder, well filled, regular. Berry, oval, creamy white with thin bloom and inconspicuous brown dots, moderately juicy, very sweet, rich and with a pleasant flavor; skin, thin, rather tough; pulp, tender, meaty; seeds, very small; berries hang well to the bunch, drying up without dropping off. This seems to be nearer a raisin grape than any other variety tested. It has so far been only moderately productive, but is not yet old enough to be in full bearing. Its season is nearly the same as Moore's early.

GREIN'S GOLDEN.—Vine, a rank, rather dense grower; shoot from 3 to 8 ft., close-jointed; leaf, rough, large, coarse, very free from disease. Bunch, on a long stem, above medium size to large, cylindrical, only occasionally shouldered, compact, regular. Berry, round, large, greenish white with a thin bluish white bloom, only becoming golden when over ripe, very juicy, slightly acid, pleasant, not rich; skin, very tender; pulp, tender and easily separated from the seeds; very good in quality. It is an abundant bearer. The yield the past three years has been from 10 to 14 lb. each year. Its season is from 10 to 14 days later than Concord. It sells well on account of its fine appearance, but is too tender for distant markets. This is a desirable white grape on account of its appearance and bearing quality.

F. B. HAYES.—Vine, a very moderate grower, open, healthy; wood, very firm and well-ripened; shoot, 1 to 3 ft., short-jointed, slender; leaf, healthy. Bunch, small, broader at base than apex, compact with many undeveloped berries. Berry, small to medium in size, round, creamy to greenish white with thin bloom, full of juice, rich, sweet, of very fine quality; skin, very tender; pulp, tough and hard to separate from the seeds. Its season is about the same as Concord. It is not an abundant bearer and would be recommended for the amateur only.

JESSICA.—Vine, a moderate grower, open; shoot, 1 to 3 ft., short-jointed; wood, well ripened, stiff; leaf, below medium size, comparatively free from disease. Bunch, small, compact, oblong, or cylindrical, seldom shouldered, regular. Berry, medium, round, creamy white with a thin white bloom, numerous and conspicuous brown dots, juicy, sweetish, very pleasant, mild and agreeable, flavor, very good. The vine has produced from 6 to 8 lb. each year for the past three years. Its season is 4 to 5 days later than Concord.

LADY.—The vine is a rather weak grower and has been a light bearer. The foliage is too subject to disease. Bunch, of medium size, cylindrical, with little or

no shoulder, not at all uniform in size, usually straggling. Berry, varies from small to large, round, creamy white with thin bloom and conspicuous dots. The smaller berries are seedless, sweet, very pleasant, not high flavor, not foxy; skin, tender; pulp, rather tough. Its use would be for the table. Its season is the same as the Concord. The berries do not ripen evenly on the bunch and are not good until fully ripe. It is scarcely to be recommended.

LADY WASHINGTON.—The vine has been a fair grower until the last season when it did not make a good or healthy growth. Bunch, small, broader at the base, tapering toward the point, moderately regular, open. Berry, small, round, creamy white with a thin bloom, not uniform in size, varying from $\frac{1}{4}$ to more than $\frac{1}{2}$ in. in diameter; the smaller ones seedless, juicy, acid without richness; skin, tender, astringent; pulp, tender, easily separated from the seeds. This is a good bearer when in health. Its season is about one week later than Concord.

MARTHA.—Vine, a moderate, very open grower; shoot, 2 to 4 ft., slender, dark, almost brown; joint, long; wood, well ripened; leaf, medium size, free from disease. Bunch, large, rather open, broad at the base, tapering to the tip. Berry, medium size, round, creamy white, almost yellow when full ripe with a thin bloom and small brown dots, but little juice, very pleasant, slightly acid, very good in quality; skin, very tender; pulp, very tender, meaty, easily separated from the seeds. Its season is some later than Concord. It yields sparingly and is not recommended for the general grower.

MASON'S SEEDLING.—The vine has been a strong grower until the last year. Bunch, medium size or above, tapering from the base to the apex, fairly compact. Berry, large, round, pale, greenish white with a very thin bloom, juicy, mild, pleasant, sub-acid, not rich; skin, very tender; pulp, tough. A very good bearer. Its season is about the same as Concord. Use, table, or for jellies, etc. It would not make a market grape on account of appearance. We could not recommend it for general planting, though it stands above the average among white grapes.

MISSOURI REISLING.—Vine, a very rank, dense grower; shoot 4 to 10 ft., joint, long; wood, well ripened; leaf, large, dark green, coarse, free from disease. Bunch, small to medium size, usually cylindrical or oblong with a small shoulder, compact. Berry, medium to large, oval, greenish white, becomes amber when over ripe with a very thin bloom and conspicuous dots; full of juice, slightly acid, with but little richness, pleasant to the taste; skin, very tender; pulp, tender. Its season is about one week later than Concord. The yield for the past three years has been from 8 to 12 lb. It is very similar in general appearance to Elvira and Etta.

MOORE'S DIAMOND.—The plant has been a good strong grower until the past season, when it made shoots of only 6 to 8 in., and looked as if about dead. Bunch, very large, shouldered, fairly compact. Berry, white or yellowish white, large, round with a thin bloom, becoming brown or blistered where exposed to the sun, juicy, sweet, mild pleasant flavor, but not rich; skin and pulp very tender. It presented the finest appearance of any of our white grapes when the vine was in good health, but its behavior the past season prevents recommending it with any degree of confidence. Its season is a little later than Concord.

NIAGARA.—The vine is a very strong grower and free from disease. Bunch, when fully developed, very large and well shouldered, tapering from the base to the tip and fairly compact; as grown here most bunches are not large and are very poorly filled. Berry, large, round, greenish white with a thin white bloom, almost sweet, without richness, slightly foxy; skin and pulp, very tender. This variety has been a fair bearer. The yield for the past two years has been 8 to 10 lb. Its season is 3 to 4 days later than Concord. It has not, with us, justified the claims that were made for it when it was introduced, and is not recommended for general planting.

NOAH.—Vine, a very vigorous, dense grower, making an excess of wood; exceptionally free from disease, either of the plant or fruit, and a regular and heavy bearer. Bunch, medium size, shouldered, very compact, the berries flattened against each

other. Berry, large, round, pale, greenish white with a thin white bloom; juice, watery, sour without richness; skin, tender; pulp, tender when fully ripe. Its season is 3 days to a week later than Concord. Its principle use would be in making jellies. The yield for the past three years has been from 10 to 14 lb. Although a heavy bearer it is not recommended.

PEARL.—Vine, a very rank and rather dense grower; shoot, 4 to 10 ft.; most of the wood well ripened; leaf, large, rough, and comparatively free from disease. Bunch, small, to medium, not shouldered, cylindrical or oblong, compact. Berry, small to medium, round, greenish white, thin bloom and a few small brown dots; moderately juicy, sweetish, quality only fair, rather flat; skin, tender; pulp, very tender. Though the plant has not reached full bearing it would be classed as a light yielder. Its season is nearly two weeks later than Concord. From our experience it could not be recommended.

POCKLINGTON.—Vine has been until the last year a very fair grower. The leaves died and dropped some for the past two years. Bunch, medium size to large, short and thick, oblong, inclined to be irregular and not well filled. Berry, very irregular in size, often imperfectly developed, oblate, creamy white when fully ripe with russet patches and inconspicuous brown dots and thin bloom, moderately juicy; quality, moderately good; skin, very tender; pulp, tender and meaty, slightly acid and some astringency next the skin. Its season is about 4 to 5 days after Concord

PRENTISS.—Vine, a moderately vigorous grower, open; shoot, 2 to 6 ft., stout, short-jointed, downy; leaf, pale green, subject to downy mildew. Bunch, small, short and thick, tapering from the base to the apex. Berry, medium to very large, oval, greenish white to pink or light red with a thin white bloom, very juicy, an agreeable mixture of sweet and sour, without high quality; skin, very tender; pulp, somewhat stringy, but tender. Its season is late, 2 to three weeks after Concord. It has been a shy bearer. The crop for the past three years being only from 2 to 4 lb.

TRANSPARENT.—Vine, a rank grower; shoot, 4 to 12 ft.; joint, of medium length; wood, well ripened; leaf, large, smooth, comparatively free from disease. Bunch, very small, 3 in. long, cylindrical, shouldered, fairly compact, regular. Berry, small to very small, pale greenish white with a very thin bloom, so nearly transparent that the seed can be seen in outline, numerous conspicuous small brown dots, rather dry, acid without richness; skin, rather tough, thin; pulp, meaty, only moderately tender. It has been so far a shy bearer. The crop this season was about 1 lb. on a vine large and old enough to have borne 15 lb. There seems no reason for recommending it.

TRIUMPH.—Vine, a moderate, stocky, healthy grower; shoot, 2 to 5 ft.; wood, well ripened; leaf, large, dark green, free from disease. Bunch, medium size, cylindrical, shouldered. Berry, medium size, round, juicy, greenish white, thin bloom, acid without richness; skin, tough; pulp, tender. Season is about 2 weeks later than Concord. The yield the past year was about 1½ lb. There seems to be no reason to recommend it.

UHLAND.—Vine, a very rank and dense grower; shoot, 3 to 10 ft, rather slender, joint, medium length. Bunch, very small, nearly cylindrical in outline, sometimes shouldered, seldom regular, often very imperfectly filled. Berry, small, greenish white, becoming almost a creamy white with a thin bloom, pleasant without positive character; skin, tender, thin; pulp, tender, meaty, almost dry, separates easily from the seeds. Berries drop easily from the stem. A shy bearer. The yield was about 2 lb. this year and was less last. Its season is 4 to 5 days later than Concord. There seems no good reason for recommending it.

WINCHELL.—This is generally conceded to be the same as Green Mountain. While there has been some difference between them here, there has been no more than between different individuals of the same variety as grown in other parts of the vineyard.

VARIETIES THAT HAVE FAILED.

The following varieties have been practical or complete failures so far as tried here.

ADIRONDACK.—Planted in 1890, has always been a very poor grower, is nearly dead and has borne no fruit.

BLACK EAGLE.—Planted in 1890, has been a very weak grower, and, though the shoots and leaves look healthy, the plant is not so large as when first set out. It has borne no fruit.

CONCORD CHASSELAS.—Planted in 1889, has been a very weak grower and though the foliage looks healthy it has never made shoots of more than 8 inches in length. It has borne three small bunches of grapes, Bunch, small. Berry, small, white, acid, not rich. Of no value here.

CONCORD MUSCAT.—Planted in 1889, died after the first year.

CORNUCOPIA.—Planted in 1888, died before the end of the first season, and was not replaced.

CREVELING.—Planted in 1889, is a very weak grower and has not been healthy. It has borne a few berries. These were small and not of good quality.

EXCELSIOR.—One plant set in 1890 and one in 1891; both are nearly dead and have borne no fruit.

HIGHLAND.—Planted in 1890, is very nearly dead and has borne no fruit.

MERRIMAC.—Planted in 1889, has always been weak, usually dropping its leaves early, and is now nearly dead. It has borne no fruit.

MAXATAWNEY.—Planted in 1889, has always been a very weak grower, is nearly dead and has borne no fruit.

PIZZARO.—Planted in 1889, has been a very poor grower and the leaves have dropped badly. It has borne no fruit.

POUGHKEEPSIE.—The vine is no larger than when first planted in 1890. It has borne no fruit.

REBECCA.—Vine, a weak grower; shoot, slender, 1 to 3 ft. long; leaf, small, yellowish green. The plant set in 1889 bore only four berries this year and none last. Berry, white, oval, mild, pleasant; skin and pulp, tender.

TELEGRAPH.—Planted in 1890; has always been a very poor grower and the leaves subject to disease. It has borne no fruit.

WAVERLY.—Planted in 1880, made a sickly growth for two years and then died.

CONCLUSIONS.

As a result of the test of varieties here and from this general reputation as grown in other places the following recommendations would be made:

Grapes for market:

Black.—Concord, Worden, Ives Seedling.

Red.—Delaware, Lindley.

White.—Grein's golden, Niagara.

For home use—List would be nearly the same:

Black.—Concord or Worden, Moore's Early.

Red.—Delaware, Lindley, Massasoit, Brighton.

White.—Grein's golden, Elvira, Niagara, Green Mountain.

There are many other varieties that are of value and probably some that with more and wider experience would be placed above part of those named. It will be seen that most of the varieties named are by no means new. Most of the new things prove to be, *not improvements on*, but only *variations from, old varieties*.

G. W. McCLUER, M.S.,

Assistant Horticulturist.

A GRAPE DISEASE.

In addition to the considerable number of parasitic and other of the grape diseases now well-known, there has recently been noticed upon this plant what seems to be a new disease, the cause of which has not been determined. From the descriptions published in Bulletin No. 2, Division of Vegetable Pathology, United States Department of Agriculture, upon "A California Vine Disease," it seems probable that we have here the same malady to contend with. The identification, however, has not been made by any one qualified to express an authoritative opinion.

Definite notice was first taken of the disease in the summer and fall of 1889. It was observed more on the Concord than on any other variety, probably because there are more Concords grown, than for any other reason. The trouble usually makes itself apparent about the middle of the summer. The edges of a few of the leaves, usually the older ones, are affected first. These turn yellow, then gradually die, and as the disease progresses the whole leaf and additional leaves are affected. Before the leaves are entirely dead they drop off leaving the vine more or less bare. The blade often separates from its stock, which adheres for a time to the stem. The disease or its effects have not been noticed on the stems until after the frost has killed the leaves. This is probably due to lack of sufficient observation, since but little attention has been paid to the plants from the time of the ripening of the fruit until the fall pruning, which is usually done in November. When the fruit was picked this season in September the shoots from which the leaves had fallen as a result of the disease were still alive, and unless the disease had been very bad there was nothing in their appearance to attract attention. November 10th it was found that on all plants on which leaves were badly affected a large part of the current season's growth was dead, sometimes back to the old wood, but more often with from 1 to 4 joints at the base still alive.

A vineyard of Concords, near the University farm, that has been poorly cultivated and otherwise poorly cared for, has shown the disease more than any other examined. In our own vineyard of Concords the

disease was worse where the vines were not cultivated than where they were, and among the vines not cultivated it seemed worst on plants carrying the most fruit.

Ives seedling, in our vineyard of varieties, was somewhat diseased in 1892, and in 1893 the disease was so bad that three-fourths of the leaves dropped and the shoots were only 6 to 12 in. long; while in another vineyard less than one-fourth of a mile away the same variety

VARIETIES SHOWING THE DISEASE

WORST IN 1892.

 Beauty.

 Centennial.

 Cottage.

 Delaware (one plant).

 Eldorado.
 Eumelan.

 Grein's golden.
 F. B. Hayes.

 Ives seedling (2 plants).

 Lady.

 Mills.
 Moore's diamond.
 Moore's early (2 plants).

 Norwood.

 Pocklington.

 Telegraph.

 Transparent.
 Wyoming red (2 plants).

VARIETIES SHOWING THE DISEASE

WORST IN 1893.

Alphonse.
 Agawam.
 August giant.
 Beauty.
 Cambridge.
 Centennial.
 Concord (one vine in the variety vineyard and several in the other.)
 Cottage.
 Delaware (one plant, but not the same as 1892).
 Duchess.
 Dracut amber.
 Early victor.

 Essex.
 Faith

 Ives seedling (all the vines in vineyard of varieties, but none in the other.)
 Jefferson.
 Jewel.
 Lady.
 Lady Washington.
 Mason's seedling.
 Mills.
 Moore's diamond.
 Moore's early (all).
 New Haven.
 Norfolk.

 Oneida.
 Pocklington.
 Rochester.
 Telegraph.
 Uhland.
 Vergennes.
 White Hall.
 Woodruff red.

 Wyoming red (2 plants).

was entirely exempt. The latter vineyard is on level land, though not low. The former is on comparatively high and well drained land. Both were kept well cultivated and were otherwise well cared for.

As noted before on page 250 one Delaware vine that was diseased in 1892 seemed healthy the next year. Some of our Concords that were badly diseased in 1891 were comparatively healthy in 1892, but were again more or less affected the past season. Whether the vines in our variety vineyard which have shed their leaves so much for the past year or two will recover and be again as good as ever remains to be seen. The varieties worst diseased in 1892 and in 1893 are arranged on p. 269 in parallel columns for comparison. It will be seen that there are more the last year, but that a few of those noted as being badly diseased in 1892 are not in the list for 1893.

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Assistant Horticulturist.

GRAPES, METHODS OF TRAINING.

In 1888 six rows of grapes were planted with a view to trying the comparative merits of some of the more simple methods of training grapes.

There were eight plants and five different varieties in each row. The varieties were Concord, Worden, Moore's early, Ives seedling and Delaware. The methods of training used have not been so varied yet as at first planned, and the results obtained have not been by any means exact.

The rows of grapes run north and south and the vines are ten feet apart in the row. The first row is trained on a horizontal trellis; the second, on a single wire; the third, on an ordinary three wire trellis with a roof of boards over it; the fourth and fifth, on a three-wire trellis; and the sixth is trained to stakes. The horizontal trellis is $3\frac{1}{2}$ ft. from the ground, made by putting cross-bars two feet long on posts $3\frac{1}{2}$ ft. high and then stretching three wires, one of which is fastened to the posts and the others to the ends of the cross-bars. The single wire is $3\frac{1}{2}$ ft. high. The wires of the third, fourth and fifth rows are 2, $3\frac{1}{2}$ and 5 ft. respectively from the ground. The roof of boards consists of a V-shaped trough made of 12-in. boards inverted over the trellis and making a roof of 20 in. wide. The thought in using the roof was that it would keep off rain and dew, and to a great extent stop the growth of the fungus which causes the black rot. The stakes in row 6 are five feet high. The method of pruning has been as nearly the same for all methods of training as it was possible to make it, and there has been no practical difference so far as the grapes on trellis are concerned; but those on stakes have necessarily been trimmed closer, usually not more than half so

much bearing wood being left to each vine as there was on the trellised rows. On the horizontal trellis there has been for three years one cane or branch of the vine run each way on each wire. On the single wire there have been two canes or branches each way, and on the upright trellises there have usually been three branches running each way, one on each wire.

From the location of the vineyard near a prominent roadway it has been impracticable to do more than estimate the yields without taking off the fruit while it was yet green, and that was not done. Taking the estimates, the Concord has done decidedly the best on the three-wire horizontal trellis and poorest on the stakes, the yield for three years on the horizontal trellis being, for the single vine, from 24 to 33 lb. each year, while the two vines on stakes gave about 5 to 8 lb. each during the same time. Concord, as well as all the rest, under the roof of boards has decayed comparatively less than on check row without the cover; but the branches have almost invariably been much inferior in size and very poorly filled. The two vines on the single wire have produced 12 to 20 lb. and one vine on the upright, three-wire trellis has yielded about the same. The yield of two vines under cover has been from 10 to 12 lb. each year.

The grapes planted for Worden have been taken out and new ones put in their place, because it is thought they were nearly all Concords.

Moore's early has done best on the three-wire horizontal trellis; next best on the three-wire upright trellis; next on the single wire; next on the covered trellis, and poorest on stakes.

Ives seedling has seemed to do a trifle better on the upright trellis; next best on the horizontal trellis; next on the single wire; next under cover; and poorest on stakes.

Delaware the past year has been perhaps somewhat better on a horizontal trellis; but the two years before it seemed to do rather better on the upright trellis. Taking the last three years together there has been practically no difference in this variety between the two methods of training. The single wire trellis gave the next best results; covered trellis next; and stakes again the poorest.

Taking the five varieties as a whole they have done best on the horizontal trellis, though there has not been much difference between that and the upright three-wire trellis except with Concord.

The vines on stakes have uniformly made the poorest growth and given the smallest yield.

The grapes on the covered trellis have rotted less than those on a row beside it, not covered, but it has also yielded considerably less from a failure of the fruit to set.

Grapes are more easily trained on trellises than on stakes and as the vine does not make such a compact mass on the trellis it is much easier to get at the fruit either in spraying or harvesting.

While there has been no chance to make a comparison of different

heights for the horizontal trellis, ours seem to be too low for the greatest convenience. It is found easier to pick the fruit by getting under the trellis than by standing at one side of it, because the branches all hang down and are in plain sight from below.

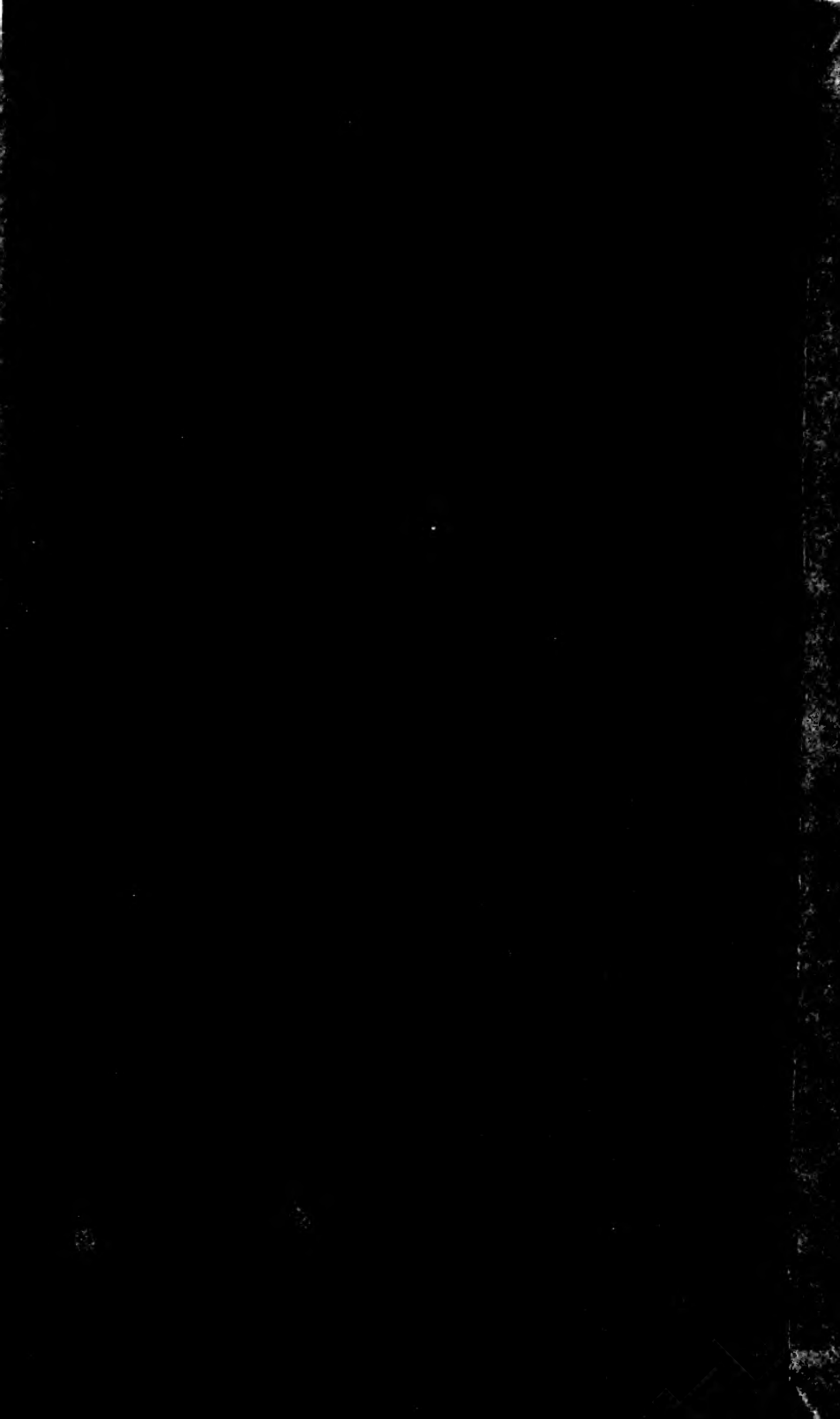
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